Notes from the 8/02/05 MI BPM Upgrade Meeting
Stephen Wolbers
These notes can be found in Beams docDB #1526.

Luciano Piccoli : TeV BPM DAQ cycles

- Luciano's transparencies can be found as Beams docDB #1914.

- I came in at the end of the talk but assume that it was clear, informative, and gave some indication of how the Tevatron system uses trigger and timing information to take measurements.

- Bob Webber summarized the things that the TeV BPM system does not perform that are needed for a working MI BPM system (or is in some way different from MI BPM requirements):

1. No requirement for single turn measurements for beam going in the opposite direction to the protons.
2. TeV BPM system automatically goes to closed orbit after making TBT measurements.
3. There is no straightforward way to look at the time window around bunch 1 (to measure the second or nth bunch).
4. First turn injection is always at the same point in the ring.
5. There is only one timing value to keep track of in the TeV BPM system.

- The extra capabilities are required to make the measurements required and will therefore be part of the work of the project.

Alberto and Dave: MI decisions that affect MI BPM requirements

- Alberto mentioned that at the most recent MI BPM department meeting some decisions were made that affect the MI BPM upgrade. In particular (I hope I wrote these down correctly, Alberto may want to correct these):

1. There is no requirement that the last turns of both extractions be measured in a single cycle. The system must have the capability to measure either one of the last turns of the two extractions during the cycles with multiple extractions.

2. All injections are required to be measured in a single cycle.

3. Bunch by bunch measurements at 2.5 MHz are not required.

4. The abort line BPMs can be instrumented and read out using the transfer line BPM hardware and software, as proposed by Bob Webber. This takes those BPMs out of the MI BPM upgrade project.

5. Closed orbit measurements with an averaging time of about 1ms (~1 KHz) is sufficient.

Manfred Wendt: Hardware Status
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- Manfred showed some slides detailing the status of various hardware components of the project. Slides can be found in docDB #1526-v2.

- Combiner boards. All components except the splitter/combiners are here. The splitter/combiners should be here this week. Once here a second board/box will be assembled and put into the tunner (position to be determined by MI - probably MI52). This will allow 2.5 MHz signals to reach the scope that is currently connected to one of the BPMs. A bid package for the bulk assembly of boards (how many?) is in purchasing.

- Transition module. A 2-channel prototype is being assembled for initial testing. All components required to build the prototype should be here by the end of August and testing will commence then. The next step is to design and construct the "pre-series" 8 channel board with the necessary controls. This will take time, as this is a complicated board and is fairly dense.

- VME crates. We should purchase 11 VME crates (7 + spares). We discussed whether we should go ahead with purchase of Dawn crates (identical to Tevatron and transfer line BPM projects). We learned today that another crate in the Tevatron has failed, giving a total of 3 failures. More investigation/thinking needs to go into this decision.

- Measurements at MI30. Manfred has made some measurements in MI30 of pbar bunches as they are being injected and transferred to the Tevatron. He showed signals (see the plots) that look quite encouraging.

Dave Capista:
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- Dave showed two transparencies with a further refinement of state messages that are needed for specifying the operation of the MI BPM system. The transparencies can be found in beams docDB #1526-v2.

- First transparency had 3 messages
    - p or pbar
    - 2.5 MHz or 53 MHz
    - Attenuator value

- There was some discussion about the need for the first or whether it could come from elsewhere. Can the attenuator/amplification values be given in "physics units" rather than "engineering units"?

- Second transparency had 4
    - enable or disable
    - Flash, TBT or closed orbit
    - Event
    - Sample bucket

- We discussed the Booster->MI transfer having a hardware trigger. This will be pushed. We should talk to Greg Vogel about details (TTL?).

- Clearly there has been great progress in producing requirements for the project over the past week or two, thanks to the efforts of many people. This should lead to a final requirements document and a dedicated design effort in the near future.